HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: **South Dayton Dump & Landfill**
EPA ID No. **OHD 980 611 388**

Contact Persons

Site Investigation:	Matt Justice Ohio Environmental Protection Agency Southwest District Office Dayton, OH	(937) 285-6040
Documentation Record:	Kristine Schnoes Tetra Tech EM Inc. Chicago, IL	(312) 946-6480

Pathways, Components, or Threats Not Scored

The surface water migration pathway was not scored because this score would contribute minimally to the overall site score. Also, current sediment analytical data for the adjacent Great Miami River are not sufficient to document that the landfill is impacting the river.

The soil exposure pathway was not scored due to the lack of targets within 200 feet of observed soil contamination.

The air migration pathway was not scored because of the lack of air analytical data.

HRS DOCUMENTATION RECORD

Name of Site: South Dayton Dump & Landfill

EPA Region: 5 Date Prepared: August 2004

Street Address of Site*: 1976 Springboro (also known as Dryden) Road, Moraine, OH 45439

City, County, State: Moraine, Montgomery County, Ohio

General Location in the State: Southwest Ohio

Topographic Map: Dayton South Quadrangle

Latitude: 39º 43' 46.0" North Longitude: 84º 13' 10.0" West

Coordinates correspond to the northeast corner of the landfill. Coordinates were determined by interpolation using maps and aerial photographs (Ref. 3; Ref. 4, pp. 17, 23, 29, and 33; and Ref. 33).

Scores

Ground Water Pathway	97.26
Surface Water Pathway	Not Scored
Soil Exposure Pathway	Not Scored
Air Pathway	Not Scored
HRS SITE SCORE	48.63

*The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	97.26	9,459.51
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	Not Scored	
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Scored	
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	Not Scored	
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	Not Scored	
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Scored	
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		9,459.51
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	48.63	

GROUND WATER MIGRATION PATHWAY SCORESHEET
REF.1, TABLE 3-1

Factor Categories and Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer:		
1. Observed Release	550	550
2. Potential to Release:		
2a. Containment	10	__
2b. Net Precipitation	10	__
2c. Depth to Aquifer	5	__
2d. Travel Time	35	__
2e. Potential to Release [lines 2a x (2b + 2c + 2d)]	500	__
3. Likelihood of Release (higher of lines 1 and 2e)	550	550
Waste Characteristics:		
4. Toxicity/Mobility	a	10,000
5. Hazardous Waste Quantity	a	100
6. Waste Characteristics	100	32
Targets:		
7. Nearest Well	50	9
8. Population:		
8a. Level I Concentrations	b	0
8b. Level II Concentrations	b	0
8c. Potential Contamination	b	441.90
8d. Population (lines 8a + 8b + 8c)	b	441.90
9. Resources	5	0
10. Wellhead Protection Area	20	5
11. Targets (lines 7 + 8d + 9 + 10)	b	455.90
GROUND WATER MIGRATION SCORE FOR AN AQUIFER		
12. Aquifer Score [(lines 3 x 6 x 11)/82,500][c]	100	97.26

Factor Categories and Factors	Maximum Value	Value Assigned
GROUND WATER MIGRATION PATHWAY SCORE		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100	97.26

[a]Maximum value applies to waste characteristics category.
[b]Maximum value not applicable.
[c]Do not round to nearest integer.

A copy of this HRS Documentation Record containing *Figure 1* is available through EPA's EDOCKET at http://www.epa.gov/edocket/.

This HRS Documentation Record is also available at the EPA Headquarters Superfund Docket:

Public Reading Room, Room B102
EPA West Building
1301 Constitution Avenue, NW
Washington, DC 20004

Telephone: (202) 566-1744
E-Mail: superfund.docket@epa.gov

A copy of this HRS Documentation Record containing *Figure 2* is available through EPA's EDOCKET at http://www.epa.gov/edocket/.

This HRS Documentation Record is also available at the EPA Headquarters Superfund Docket:

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A copy of this HRS Documentation Record containing *Figure 3* is available through EPA's EDOCKET at http://www.epa.gov/edocket/.

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Telephone: (202) 566-1744
E-Mail: superfund.docket@epa.gov

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Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, Final Rule, 40 CFR Part 300, Appendix A, 55 FR 51533. December 14, 1990. On-Line Address: http://www.epa.gov/superfund/sites/npl/hrsres/index.htm#HRS%20Rule. Excerpt. [1 page]
2.	EPA. Superfund Chemical Data Matrix. January 2004. Excerpt. [16 pages]
3.	U.S. Geological Survey (USGS). 7.5-Minute Series Topographic Maps of Miamisburg, 1965, photorevised 1987; Dayton North and Trotwood, 1965, photorevised 1992; and Dayton South, 1966, photorevised 1991, Quadrangles, Ohio. Groundwater Migration Pathway Target Distance Limit Map. Modified by Tetra Tech EM Inc. [1 page]
4.	EPA. Aerial Photographic Analysis of South Dayton Dump Site, Moraine, Ohio. June 2002. [42 pages]
5.	TechLaw, Inc. Draft Title Search Report, South Dayton Dump Site. Prepared for EPA under Contract No. 68-W-00-083. March 27, 2001. [175 pages]
6.	TechLaw, Inc. Draft Title Search Addendum, South Dayton Dump Site. Prepared for EPA under Contract No. 68-W-00-083. May 30, 2003. [43 pages]
7.	The Payne Firm, Inc. Environmental Data Summaries, South Dayton Landfill (Grillot Landfill), Moraine, Ohio. Prepared for Coolidge, Wall, Womsley & Lombard. July 26, 2002. [576 pages]
8.	PRC Environmental Management, Inc. Focused Site Inspection Prioritization Site Evaluation Report. Prepared for the EPA under Contract No. 68-W8-0084. February 10, 1995. [52 pages]
9.	Hobart Corporation. Correspondence from James J. Carleton to Patrick Gorman, Ohio Environmental Protection Agency (OEPA), Regarding Solvent Disposal at the South Dayton Landfill. April 10, 1984. [15 pages]
10.	Industrial Waste Disposal Company, Inc. Correspondence from Michael J. Quigley to EPA Region 5, Regarding Notification of Hazardous Waste Site for the South Dayton Dump & Landfill. June 9, 1981. [4 pages]
11.	TCA Environmental, Inc. Environmental Remediation Report at Valley Asphalt, Dryden Road, Moraine, Ohio, Montgomery County. Prepared for Valley Asphalt. September 5, 2000. [88 pages]
12.	OEPA. Emergency Response Section District Office Investigation Report. May 18, 2000. [1 page]
13.	OEPA. Preliminary Assessment Narrative and Form. May 6, 1985. [8 pages]
14.	Ecology and Environment, Inc. Screening Site Inspection Report for South Dayton Dump, Moraine, Ohio. September 23, 1991. [74 pages]

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15. OEPA, Southwest District Office. Site Team Evaluation Prioritization Report, South Dayton Dump and Landfill. December 24, 1996. [215 pages]

16. Schnoes, K., Tetra Tech EM Inc. (Tetra Tech). Project Note to South Dayton Dump & Landfill file, Subject: Analytical Data Package for 1996 Site Team Prioritization Report. March 2, 2004. [239 pages]

17. Schnoes, K., Tetra Tech. Project Note to South Dayton Dump & Landfill file, Subject: Analytical Data Package for 1991 Screening Site Inspection Report. February 17, 2004. [138 pages]

18. U.S. Geological Survey. Ground-Water Resources of the Dayton Area, Ohio. Geological Survey Water-Supply Paper 1808. Prepared in Cooperation with the Miami Conservation District and the Ohio Department of Natural Resources, Division of Water. 1966. [184 pages]

19. Schnoes, K., Tetra Tech. Record of Telephone Conversation with Deborah Avery, Environmental Department, Delphi Automotive Systems, Regarding Drinking Water Wells. February 27, 2004. [1 page]

20. OEPA. Electronic Mail Transmission from Gina Hayes to Amber Conforti, Tetra Tech, Regarding Drinking Water Wells Within the South Dayton Dump & Landfill Target Distance Limit, Including Attachments Containing Three Maps Depicting Drinking Water Well Locations and Recharge Areas and Source Water Protection Areas. February 3, 2004. [5 pages]

21. City of Oakwood, Ohio. Facsimile Transmission from David Ramsey, Public Works, to Amber Conforti, Tetra Tech, Regarding Municipal Drinking Water Wells. February 10, 2004. [12 pages]

22. Montgomery County, Ohio. Correspondence from Richard Brinkman, Superintendent, Sanitary Engineering Department, to Kristine Schnoes, Tetra Tech, Regarding Stand-by Drinking Water Wells. April 5, 2004. [12 pages]

23. City of West Carrollton, Ohio. Correspondence Regarding Municipal Drinking Water Wells. February 2004. [4 pages]

24. OEPA. Correspondence From Kirk Leifheit to Donald Hill, City of West Carrollton, Regarding OEPA's Endorsement of the West Carrollton, Ohio Wellhead Protection Plan, Including the West Carrollton Groundwater Protection Committee Report Dated January 15, 1998. March 9, 1998. [20 pages]

25. Montgomery County, Ohio. Electronic Mail Transmission from Richard Brinkman to Kristine Schnoes, Tetra Tech, Regarding Stand-by Drinking Water Wells, Including Well Logs. April 26, 2004. [2 pages]

26. OEPA. Correspondence from Matt Justice to Karen Cibulskis, U.S. EPA, Regarding South Dayton Dump and Landfill Request For Information. November 12, 2002. [3 pages]

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30. Dayton Power and Light Company (DP&L). Correspondence from Scott Arentsen to Matt Justice, OEPA, Regarding the Well Log for Monitoring Well GW-7 at DP&L's 1900 Dryden Road Facility. August 6, 2004. [2 pages]

31. Dyncorp Systems and Solutions LLC, a CSC Company. Electronic Mail Transmission from Tanya Amme to Sandy Anagnostopoulos, Tetra Tech, Regarding SCDM Values for Trichloroethylene. August 9, 2004. [4 pages]

32. EPA. Correspondence from Valdas V. Adamkus, Regional Administrator, to Honorable George V. Voinovich, Governor of Ohio, Regarding Approval of the Ohio Wellhead Protection Program. May 28, 1992. [2 pages]

33. Topozone. USGS 7.5-Minute Series Topographic Map of the Dayton South, Quadrangle, Ohio, Including South Dayton Dump & Landfill Coordinates. On-Line Address: http://www.topozone.com/map.asp?latd=39&latm=43&lats=46&lond=84&lonm=13&lons=10&datum=NAD83&u=6. August 17, 2004. [1 page]

34. U.S. Geological Survey. Electronic Mail Transmission from Michael Eberle to Kristine Schnoes, Tetra Tech, Regarding Depth of the Great Miami River in Dayton, Ohio. September 2, 2004. [3 pages]

35. LJB, Inc. Addendum to Remedial Action Plan, DP&L Transportation Center, 1900 Dryden Road, Dayton, Montgomery County, Ohio. Prepared for Dayton Power & Light. Submitted to Division of State Fire Marshal, Bureau of Underground Storage Tanks. August 1, 2002. [27 pages]

SITE SUMMARY

The South Dayton Dump & Landfill (SDD) is located at 1976 Springboro (also known as Dryden) Road, Montgomery County, Ohio (see Figure 1). SDD occupies at least 33 acres (see Figure 2) (Ref. 3). This include the northern portion of the property where SDD activities have been documented (Ref. 4 pp 15, 17 and 19). In 1937, Horace Boesch purchased the SDD (Ref. 5, p. 11, and Ref. 6, p. 13). In 1947, Cyril Grillot became the primary owner of the SDD (Ref. 5, p. 16, and Ref. 6, p. 13). Alcine Grillot operated the SDD from about 1950 until 1996 (Ref. 7, p. 87). The current SDD owners, Kathryn Boesch and Margaret Grillot, inherited the property in 1980 and 1998, respectively (Ref. 7, p. 82).

The SDD is located in a primarily industrial area. The nearest residences are in a trailer park located within 0.25 mile southeast of the SDD. The SDD is bordered on the north and west by the Great Miami River, on the east by a Dayton Power and Light power plant, and on the south by a pallet manufacturing and repair company. Several light industrial facilities are also located adjacent to the eastern boundary of the SDD along Springboro Road. A 5-acre pond south of the SDD is a former extraction pit that has filled with water (Ref. 8, p. 7). Ground water contamination has been identified beneath and has been attributed to the SDD.

Operation History

Extraction pits were excavated at the SDD after 1936 (Ref. 4, pp. 13 and 15) and landfill operations began in 1941 and filled in the extraction pits (Ref. 8, pp. 7 and 10). The 5-acre pond south of the landfill is a former extraction pit that has filled with water (Ref. 8, p. 7). Also, based on historic documentation and aerial photographs, landfill operations may have occupied an additional 10 to 12 acres north of the SDD (Ref. 4, pp. 15 and 17 and Ref. 26, pp. 1 through 4). Landfill and extraction operations began in the northern portion of the SDD beneath the current location of the Valley Asphalt Plant and continued south across the SDD (Ref. 4, pp. 15, 17, 19, and 21).

Before 1970, a significant disposal practice at the landfill was open burning of materials, primarily vegetation and wood wastes. Between 1950 and 1970, drummed wastes were occasionally accepted at the landfill. The drums were emptied and either buried or sold to drum recyclers (Ref. 8, p. 10; Ref. 14, p. 12). Between June 1973 and July 1976, drums of hazardous waste from two nearby Hobart Corporation (Hobart) facilities in Dayton, Ohio, were accepted at the landfill. The drums were transported by Joseph Syspeck, a disposal broker and waste hauler for Hobart. About 15 55-gallon drums of waste per month were transported from Hobart to the SDD or to the Blaylock Landfill during this time. The drums contained the cleaning solvents 1,1,1-trichloroethane; methyl ethyl ketone; and xylene; cutting oils; paint; Stoddard solvent; and machine-tool, water-based coolants (Ref. 8, pp. 10 and 11; Ref. 9, pp. 1 and 2; and Ref. 14, pp. 12 and 13). During previous investigations, drums were noted at the landfill, some of which still contained nonliquids. In May 1978, the Montgomery County Combined General Health District (MCCGHD) and Ohio Environmental Protection Agency (OEPA) conducted an inspection of the landfill and noted several problems, including the presence of containers labeled “hazardous” (Ref. 27, p. 1).

Operating licenses held by the landfill include the following (Ref. 7, p. 100):

- 1969 to 1974 - License to accept commercial, industrial, and household wastes
- 1975 - License to accept sludges and demolition waste
- 1976 to 1986 - License to accept dry commercial, industrial, household, and salvageable wastes and for wood burning.

In December 1994, during a U.S. Environmental Protection Agency (EPA) focused site inspection prioritization (FSIP) at the landfill, the landfill operated under a solid waste disposal permit issued by the Montgomery County Health Department (MCHD). This permit allowed disposal of solid, inert, insoluble materials such as unregulated foundry sand, slag, glass, and demolition debris. In 1994, the landfill's only customer was the General Motors Corporation Delco-Moraine Plant (GMC), which is located about 0.5 mile northeast of the landfill. The GMC wastes disposed of at the landfill primarily included wooden pallets, concrete, and scrap wood (Ref. 8, p. 11).

In addition to landfilling and open burning activities, Alcine Grillot formed Moraine Recycling, Inc. (MRI), in 1970. MRI constructed and operated a furnace-like device called an "air curtain destructor" at the landfill. The air curtain destructor was not an incinerator but rather a "controlled open burning device," and it was to be operated under a special open burning permit. Several trial burns were initiated, but the project was abandoned because the Ohio Department of Health never granted final approval of the permit (Ref. 8, p. 10).

Further evidence of hazardous waste disposal at the landfill comes from a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Notification of Hazardous Waste Site Form submitted by Industrial Waste Disposal Company, Inc. (IWD), on June 9, 1981. The notification indicates that the landfill was used as a disposal facility for industrial and municipal wastes from IWD's customers. The notification does not include information concerning quantities of waste, specific types of wastes, or dates of disposal (Ref. 8, p. 11; Ref. 10, p. 1).

In 2000, evidence of former landfill operations beneath the current Valley Asphalt Plant was discovered when drums were encountered during excavation and installation of a new sewer line at the Valley Asphalt Plant (Ref. 11, p. 2). The drums were located within the landfill area. World War II-era documents were also discovered in the excavation area (Ref. 12, p. 1). Samples of drum contents contained the following compounds: Aroclor-1254 (75,000 micrograms per kilogram [µg/kg]), benzene (7,000 µg/kg), 2-butanone (2,500 µg/kg), chlorobenzene (1,700 µg/kg), ethylbenzene (84,000 µg/kg), 4-methyl-2-pentanone (18,000 µg/kg), toluene (530,000 µg/kg), trichloroethene (64,000 µg/kg), vinyl chloride (840 µg/kg), and xylene (340,000 µg/kg) (Ref. 11, pp. 17, 20, and 21). The drums and approximately 2,217 tons of contaminated soil surrounding the drums were removed from the landfill (Ref. 11, pp. 2 and 3). Samples of the soil contained: ethylbenzene (7 µg/kg), toluene (33 µg/kg), and xylenes (37 µg/kg) (Ref. 11, p. 42). A contractor for the Valley Asphalt Plant removed the drums and associated soil contamination in 2000 from an approximately 600 square foot area in the central portion of the landfill (Ref. 11, pp. 1, 2, 7, and 8).

The landfill closed in early 1996 (Ref. 15, p. 7).

Previous Investigations

In 1985, OEPA prepared a preliminary assessment (PA) report for the SDD that indicates that hazardous waste at the landfill poses a threat to the underlying drinking water aquifer and the adjacent Great Miami River. The PA report recommends an investigation at the landfill, including installation of monitoring wells (Ref. 13, pp. 1 and 2).

In 1990, EPA's field investigation team (FIT) conducted a screening site inspection (SSI). During the SSI, EPA collected 11 soil samples at and near the landfill. Soil sample analytical results indicated the presence of volatile organic compounds (VOC), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), and metals at concentrations significantly above background concentrations. For example, 1,2-dichloroethene was detected at a concentration of 200 micrograms per kilogram (µg/kg); benzo(a)pyrene was detected at concentrations of up to 5,700 µg/kg; PCBs were detected at concentrations

of up to 4,200 µg/kg; and lead was detected at concentrations of up to 3,300 milligrams per kilogram (mg/kg) (Ref. 8, p. 7; Ref. 14, pp. 24 and 25).

In 1996, OEPA conducted a Site Team Evaluation Prioritization (STEP) investigation that included soil, sediment, and ground water sampling (Ref. 15, p. 17). Three monitoring wells were installed at the landfill (Ref. 15, p. 19). Ground water sample analytical results indicate the presence of VOCs, including 1,2-dichloroethene at concentrations up to 150 micrograms per liter (µg/L); 1,1-dichloroethane at concentrations of up to 13 µg/L; toluene at concentrations of up to 15 µg/L; and chloroethane at concentrations of up to 22 µg/L (Ref. 15, p. 27).

Between 1998 and 2002, the landowners conducted several investigations at the landfill, including monitoring well installation and ground water and surface water sampling. In January 1998, ground water samples were collected from monitoring wells installed by OEPA. In May 1998, ground water monitoring wells MW-201 through 204 were installed and samples were collected. In February 1999, ground water monitoring wells MW-206 through 210 and 212 were installed and samples were collected. The ground water monitoring well network was sampled again in November 1999, May 2000, June 2001, and June 2002. In May 2000, surface water and sediment samples were collected from the ponds at the landfill and the large water-filled gravel pit in the southern portion of the landfill (Ref. 7, pp. 102 and 103). Ground water analytical results from 2002 indicate the presence of vinyl chloride at concentrations of up to 180 µg/L; 1,1-dichloroethane at concentrations of up to 39 µg/L; 1,2-dichloroethene (total) at concentrations of up to 480 µg/L; trichloroethene at concentrations of up to 76 µg/L; 1,1,1-trichloroethane at concentrations of up to 5.2 µg/L; and chlorobenzene at concentrations of up to 29 µg/L (Ref. 7, p. 46).

An observed release of chloroethane, 1,1-dichloroethane, 1,2-dichloroethene, and toluene is documented by the chemical analytical results for ground water samples collected from monitoring wells during the OEPA STEP investigation. The observed ground water contamination is present in the Great Miami Aquifer, a sole-source aquifer that provides drinking water to the following receptors within 4 miles of the landfill: (1) the employees of the Delphi Automotive Systems Plant, (2) the residents of the Cities of Oakwood and West Carrollton, and (3) residents of Montgomery County served by Montgomery County's standby wells. A wellhead protection area associated with the West Carrollton wellfield exists within the 4-mile target distance limit for the landfill (Ref. 15, pp. 27, 28, 29, 31, and 32; Ref. 24, p. 1).

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of Source: Landfill Number of source: 1

Source Type: Landfill

Description and Location of Source:

Source 1 is an unlined landfill that occupies at least 33 acres (see Figure 2) (Ref 3; Ref. 4, pp. 15, 17, and 19). Landfill operations conducted between 1941 and 1996 filled in former extraction pits. Industrial and hazardous waste were accepted at the landfill (Ref. 8, pp. 10 and 11; Ref. 14, pp. 12 and 13; and Ref. 27, p. 1). Ground water contamination has been identified beneath the landfill and has been attributed to the SDD.

The SDD is located in a primarily industrial area. The nearest residences are in a trailer park located within 0.25 mile southeast of the SDD. The SDD is bordered on the north and west by the Great Miami River, on the east by a Dayton Power and Light power plant, and on the south by a pallet manufacturing and repair company. Several light industrial facilities are also located adjacent to the eastern boundary of the SDD along Springboro Road (Ref. 8, p. 7). A 5-acre pond south of the SDD is a former extraction pit that has filled with water.

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

2000 Valley Asphalt Plant Excavation
In 2000, drums were discovered during an excavation and installation of a new sewer line in the northern portion of the landfill beneath the Valley Asphalt Plant (Ref. 11, p. 2). Samples of the drum contents contained the following compounds: Aroclor 1254 (75,000 micrograms per kilogram [µg/kg]), benzene (7,000 µg/kg), 2-butanone (2,500 µg/kg), chlorobenzene (1,700 µg/kg), ethylbenzene (84,000 µg/kg), 4-methyl-2-pentanone (18,000 µg/kg), toluene (530,000 µg/kg), trichloroethene (64,000 µg/kg), vinyl chloride (840 µg/kg), and xylene (340,000 µg/kg) (Ref. 11, pp. 17, 20, and 21). Samples of this soil contained the following compounds: ethylbenzene (7 µg/kg), toluene (33 µg/kg), and xylenes (37 µg/kg) (Ref. 11, p. 42). The drums and approximately 2,217 tons of contaminated soil surrounding the drums were removed by a potentially responsible party (PRP) contractor from an approximately 600 square foot area from the central portion of the landfill (Ref. 11, pp. 2, 3, 7, and 8).

The PRP contractor collected samples from the excavated contaminated soils and the contents of the drums removed from the landfill. The analytical results for these samples are presented below.

Source No: 1

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Sample Quantitation Limit	Ref.
01A	Solid	5/17/00	Aroclor-1254	75,000 µg/kg	1 µg/kg	11, p. 17
01A	Solid	5/17/00	Benzene	7,000 µg/kg	500 µg/kg	11, p. 20
01A	Solid	5/17/00	2-Butanone	2,500 µg/kg	2,500 µg/kg	11, p. 20
01A	Solid	5/17/00	Chlorobenzene	1,700 µg/kg	500 µg/kg	11, p. 20
01A	Solid	5/17/00	Ethylbenzene	84,000 µg/kg	2,000 µg/kg	11, p. 20
01A	Solid	5/17/00	4-Methyl-2-pentanone	18,000 µg/kg	2,500 µg/kg	11, p. 20
01A	Solid	5/17/00	Toluene	530,000 µg/kg	5,000 µg/kg	11, p. 20
01A	Solid	5/17/00	Trichloroethene	64,000 µg/kg	2,000 µg/kg	11, p. 21
01A	Solid	5/17/00	Vinyl chloride	840 µg/kg	500 µg/kg	11, p. 21
01A	Solid	5/17/00	Xylene	340,000 µg/kg	2,000 µg/kg	11, p. 21
20472	Soil	6/19/00	Ethylbenzene	7 µg/kg	5 µg/kg	11, p. 42
20472	Soil	6/19/00	Toluene	33 µg/kg	5 µg/kg	11, p. 42
20472	Soil	6/19/00	Xylene	37 µg/kg	5 µg/kg	11, p. 42

1996 STEP Investigation

During the 1996 STEP investigation by OEPA soil samples were collected throughout the landfill area (Ref. 15, p.17). The sample locations were selected based on historical information, field observations (including the appearance of the soil), and photoionization detector readings (Ref. 15, p. 17). Of the soil samples, S01 was collected at a depth of 4 to 4.5 feet near the former drum area in the north-central portion of the landfill; S08 was collected from a depth of 2 to 3 inches a the steep western slope (levee) that leads to the Great Miami River floodplain, immediately below a broken drum containing a hard green product; S09 was collected from a depth of 3 to 6 inches from the western slope immediately below four rusty and empty drums; and S11 was collected from a depth of 3 to 4 inches from an east-west trending ravine on the southeast side of the site (Ref. 15, p. 17). The analytical data for samples S01, S08, S09, and S11 are presented below.

A background soil sample, S07, was collected during this sampling event from a depth of 0 to 2 inches from a location on the southwest side of the water-filled gravel pit located to the southwest of the landfill (Ref. 15, pp. 17, 18, and 19). The analytical results for S07 were either non-detect or significantly less than the landfill soil samples for the hazardous substances presented in the table below (Ref. 15, pp. 17 and 20; Ref. 16, pp. 89, 159, 160, and 226). The analytical results for S07 demonstrate that the presence of these hazardous substances is not typical of soils in the area.

Most of the polycyclic aromatic hydrocarbons (PAH) detected in soil samples at the landfill during the STEP investigation were also detected during the SSI. Concentrations of PAHs for some soil samples collected during the SSI were significantly greater than the STEP investigation data, including concentrations of 2-methylnaphthalene (1,800 µg/kg), phenanthrene (16,000 µg/kg), fluoranthene (21,000 µg/kg), pyrene (13,000 µg/kg), and benzo(a)pyrene (5,700 µg/kg) (Ref. 14, p. 24). However, the most recent STEP investigation PAH soil analytical data are included in the source sample table below.

Sample ID[a]	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Sample Quantitation Limit	Ref.
S01 and EBNA7	Soil	07/09/96	Tetrachloroethene	59J µg/kg	11 µg/kg	15, p. 18, and 16, p. 69
S08 and EBNB5	Soil	07/09/96	2-Methylnaphthalene	390 µg/kg	370 µg/kg	15, p. 18, and 16, p. 162
S08 and EBNB5	Soil	07/09/96	Phenanthrene	1,700 µg/kg	370 µg/kg	15, p. 18, and 16, p. 163
S09 and EBNB6DL	Soil	07/09/96	di-n-Butylphthalate	2,100JD µg/kg	350 µg/kg	15, p. 18, and 16, p. 172
S08 and EBNB5	Soil	07/09/96	Fluoranthene	2,000 µg/kg	370 µg/kg	15, p. 18, and 16, p. 163
S08 and EBNB5	Soil	07/09/96	Pyrene	1,900 µg/kg	370 µg/kg	15, p. 18, and 16, p. 163
S09 and EBNB6DL	Soil	07/09/96	Butylbenzyl-phthalate	32,000D µg/kg	350 µg/kg	15, p. 18, and 16, p. 172
S08 and EBNB5	Soil	07/09/96	Benzo(a) anthracene	1,100 µg/kg	370 µg/kg	15, p. 18, and 16, p. 163
S08 and EBNB5	Soil	07/09/96	Chrysene	1,200 µg/kg	370 µg/kg	15, p. 18, and 16, p. 163
S09 and EBNB6DL	Soil	07/09/96	Bis(2-ethylhexyl) phthalate	2,500JD µg/kg	350 µg/kg	15, p. 18, and 16, p. 172

Source No: 1

Sample ID[a]	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Sample Quantitation Limit	Ref.
S08 and EBNB5	Soil	07/09/96	Benzo(k) fluoranthene	950 µg/kg	370 µg/kg	15, p. 18, and 16, p. 163
S11 and EBNB8	Soil	07/09/96	Benzo(b) fluoranthene	1,300 µg/kg	370 µg/kg	15, p. 19, and 16, p. 181
S11 and EBNB8	Soil	07/09/96	Benzo(a)pyrene	1,000 µg/kg	360 µg/kg	15, p. 19, and 16, p. 181
S11 and EBNB8	Soil	07/09/96	Indeno(1,2,3-cd) pyrene	910 µg/kg	360 µg/kg	15, p. 19, and 16, p. 181
S11 and EBNB8	Soil	07/09/96	Dibenzo(a,h) anthracene	450 µg/kg	360 µg/kg	15, p. 19, and 16, p. 181
S11 and EBNB8	Soil	07/09/96	4,4'-DDD	4.4 µg/kg	1.9 µg/kg	15, p. 19, and 16, p. 231
S09 and EBNB6DL	Soil	07/09/96	Aroclor-1254	850D µg/kg	35 µg/kg	15, p. 18, and 16, p. 229
S09 and EBNB6	Soil	07/09/96	Aroclor-1260	1,400D µg/kg	35 µg/kg	15, p. 18, and 16, p. 229

Notes:

[a] Two Sample IDs are provided. One Sample ID is issued while samples are being collected, and the laboratory analyzing the samples issues a separate Sample ID.

J The reported concentration is estimated.

D Sample diluted because the original quantitation exceeded the instrument calibration range.

2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	Reference
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water: The landfill is unlined. Monitoring well MW-101 is 38 feet deep, and the log does not mention the presence of any liner. Solvents were known to have been disposed of at the landfill and have been detected in soil and ground water samples collected from the area at concentrations significantly above background levels (see Sections 2.2.2 and 3.1.1 of this document). Based on evidence of hazardous substance migration from the landfill and the lack of any containment features that would prevent a release to ground water, a containment factor of 10 is assigned.	10	1, Table 3-2, 8, pp. 10 and 11, 9, pp. 1 and 2, 10, p. 1, 15, p. 27 and 106
Release via overland migration and/or flood:	NS	

Note:
NS Not scored

2.4.2 HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity

Description

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored.

Hazardous Constituent Quantity Assigned Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

Description

The information available is not sufficient to evaluate Tier B source hazardous waste quantity; therefore, hazardous wastestream quantity is not scored.

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3 Volume

Description

The information available is not sufficient to evaluate Tier C source hazardous waste quantity (that is, the depth of the landfill is unknown); therefore, volume is assigned a value of zero (Ref. 1, Section 2.4.2.1.3).

Volume Assigned Value: 0

2.4.2.1.4 Area

Description

The aerial extent of landfill activities is at least 33 acres and maybe as much as 45 acres based on historical documentation and aerial photographs (Ref 3; Ref. 4, pp. 15, 17, and 19; Ref. 26, pp. 1 through 4). The estimate of 33 acres was used for the hazardous waste quantity calculation.

Source Type	Units (ft^2)	References
Landfill	33 acres x 43,560 = 1,437,480 ft^2	Ref 3; Ref. 4, pp. 15, 17, and 19; Ref. 26, pp. 1 through 4

Sum (ft^2): 1,437,480
Equation for Assigning Value (Ref. 1, Table 2-5): 1,437,480 /3,400

Area Assigned Value: 422.79

2.4.2.1.5 Source Hazardous Waste Quantity Value

Highest assigned value assigned from Ref. 1, Table 2-5: 422.79

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Containment Factor Value by Pathway				
			Ground Water (GW) (Ref. 1, Table 3-2)	Surface Water (SW)		Air	
				Overland/ flood (Ref. 1, Table 4-2)	GW to SW (Ref. 1, Table 3-2)	Gas (Ref. 1, Table 6-3)	Particulate (Ref. 1, Table 6-9)
1	422.79	N	10	NS	NS	NS	NS

Note:

NS Not scored

Description of Other Possible Sources

A 5-acre Former Auto Salvage Yard began operating in the 1960s (Ref. 4, pp. 19 and 21). The yard was located in the central portion of the landfill (Source 1) and extraction pit activities. Former Auto Salvage Yard operations likely resulted in soil contamination from vehicles stored at the Yard. An aerial photograph indicates dark staining of soil in the area (Ref. 4, p. 22 and 23). Former Auto Salvage Yard activities concluded in 1994, and the vehicles were removed (Ref. 4, p. 30). No additional information such as analytical data is available for this possible source.

In 1981 and 1988 aerial photographs, a trench is visible in the eastern edge of the landfill. The trench appears to originate from behind one of the buildings on Dryden Road. The trench contained debris and dark material or liquid. The trench drains onto the south-central portion of the landfill (Source 1) and may have discharged to the water-filled former extraction pit in the southern portion of the landfill (Ref. 4, pp. 25, 27, and 29).

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 GENERAL CONSIDERATIONS

Ground Water Migration Pathway Description

The SDD is located in the Till Plains section of the Central Lowlands Physiographic Province (Ref. 15, p. 12). The sources of ground water contamination are located over the Great Miami Aquifer, which is composed of unconsolidated glacial outwash deposits. The Great Miami Aquifer is the only production aquifer in Montgomery County, Ohio, and is located in a designated secondary wellhead protection area. Almost all of the water consumed in Montgomery County, Ohio, comes from this aquifer (Ref. 15, p. 12). The Great Miami Aquifer consists of 25 to 250 feet of hydraulically connected silt, sand, and gravel that overlie bedrock composed of Ordovician-aged, interbedded shales and limestones of the Richmond Group (Ref. 15, pp. 12, 13, and 57; Ref. 8, p. 13; and Ref. 18, p. 14). The aquifer is approximately 150 to 250 feet thick near the Great Miami River but may extend to only 25 feet below ground surface (bgs) several miles inland from the river (Ref. 8, p. 13 and Ref. 14, p. 28).

The unconsolidated glacial outwash deposits of the Great Miami Aquifer may be separated into an upper and lower aquifer by discontinuous clay lenses known as till zones (Ref. 15, p. 13; and Ref. 18, pp. 36, 39, and 41). These clay lenses occur in the vicinity of the landfill at a depth of approximately 60 feet below ground surface (Ref. 29). Where the till is absent, the aquifers are one hydrogeologic unit (Ref. 15, p. 13). Where till is interbedded with the sand and gravel deposits, recharge is slow (Ref. 18, p. 16). In the vicinity of the landfill, the till-rich zone is widely variable, ranging between 3 and 20 feet thick. In addition, according to well logs and preliminary test holes, some areas show almost no till at the position of the till-rich zone. However, in other areas the till-rich zone is hydraulically effective in separating the upper and lower aquifers (Ref.18, pp. 39 - 41). Because the clay lenses are discontinuous, the Great Miami Aquifer is considered one hydraulic unit for purposes of HRS evaluation of the SDD.

The till-rich zone is highly variable within a 4-mile radius of the landfill. South of the landfill, the till-rich zone is discontinuous or almost absent, and the upper and lower aquifers function as one hydraulic unit. In areas of southwest Dayton, the till thickness ranges from 5 to 70 feet. The till-rich zone is highly effective in separating the upper and lower aquifers. In much of central Dayton, the till-rich zone is composed of two layers of till, an upper, relatively thick bed and a lower, thinner bed that is separated by approximately 20 to 35 feet of sand and gravel. However, there are areas in central Dayton that do not contain a well-defined till layer (Ref. 18, pp. 36 - 44). Generally, till occurs as discontinuous clay lenses throughout at least a 3-mile radius of the landfill (Ref. 14, p. 28).

Figure 3 includes the locations of public drinking water supply wells that occur within four miles of the landfill. Ground water depth ranges from 12 feet bgs beneath the south portion of the landfill to 18 feet bgs beneath the west portion of the landfill (Ref. 15, p. 14). Ground water flow is influenced by the topography of the Great Miami River (Ref. 15, p. 14). In the area of the landfill, the direction of the ground water flow is likely to the west, toward the Great Miami River. The river might act as a recharge and discharge zone in the area, and its southerly flow might influence the ground water to flow in a more west-southwest direction. During a site investigation, the hydraulic gradient was determined to be 0.027 foot/foot (Ref. 15, p. 14). In the vicinity of the landfill, ground water yields are expected to be 500 to 1,000 gallons per minute (Ref. 15, p. 57). The Great Miami River is approximately 2 to 10 feet deep in the area of the site (Ref. 34, p. 2). Therefore, the river does not entirely transect the aquifer of concern and is not acting as a discontinuity in the area of the site.

The ground water in the area is mainly recharged by induced infiltration, which is infiltration through streambeds. Ground water recharge varies seasonally, and occurs primarily between late fall and early spring

in the Dayton area (Ref. 18, pp. 72 - 77). Prior to ground water pumping, the water level in the Dayton area probably ranged from 5 to 20 feet bgs. Several wells in the area have static water levels ranging from 20 to 40 feet bgs. This decrease is most likely the result of continued pumping over a long period of time (Ref. 18, p. 119).

- Aquifer/Stratum 1 (uppermost): Great Miami Aquifer

Description: The Dayton area overlies a pre-Pleistocene river valley known as the Teays Valley. Glaciers filled the 200- to 400-foot valley with sand and gravel outwash (Ref. 14, p. 28). The Great Miami Aquifer is composed of these unconsolidated glacial outwash deposits and is the only production aquifer in Montgomery County, Ohio. The Great Miami Aquifer consists of 25 to 250 feet of hydraulically connected silt, sand, and gravel. The aquifer overlies Ordovician-aged interbedded shales and limestones of the Richmond Group (Ref. 15, pp. 12 and 13). However, the shales and limestones do not yield sufficient water for wells (Ref. 18, p. 15). The bedrock occurs approximately 180 to 240 feet bgs (Ref. 15, pp. 12 and 13).

SUMMARY OF AQUIFER BEING EVALUATED

Aquifer No.	Aquifer Name	Is Aquifer Interconnected with Upper Aquifer within 2 miles? (Y/N/NA)	Is Aquifer Continuous within 4-mile TDL? (Y/N)	Is Aquifer Karst? (Y/N)
1	Great Miami Aquifer	NA	Y	N

3.1 LIKELIHOOD OF RELEASE

3.1.1 OBSERVED RELEASE

Aquifer Being Evaluated: **Great Miami Aquifer**

Multiple observed releases are documented for the SDD. Chemical analytical results for monitoring well ground water samples document observed releases from the landfill. In 1996, OEPA conducted a STEP investigation that included soil, sediment, and ground water sampling (Ref. 15, p. 17). Four monitoring wells were installed at the landfill (Ref. 15, p. 19). Ground water analytical results indicate the presence of VOCs, including 1,2-dichloroethene at concentrations of up to 150 µg/L; 1,1-dichloroethane at concentrations of up to 13 µg/L; toluene at concentrations of up to 15 µg/L; and chloroethane of up to 22 µg/L (Ref. 15, p. 27).

Between 1998 and 2002, the landowners conducted several investigations at the landfill, including ground water and surface water sampling and monitoring well installation. Ground water analytical results from 2002 indicate the presence of vinyl chloride at concentrations of up to 180 µg/L; 1,1-dichloroethane at concentrations of up to 39 µg/L; 1,2-dichloroethene (total) at concentrations of up to 480 µg/L; trichloroethene at concentrations of up to 76 µg/L; 1,1,1-trichloroethane at concentrations of up to 5.2 µg/L; and chlorobenzene at concentrations of up to 29 µg/L (Ref. 7, p. 46). Although analytical results from the landowner document an observed release, these data are not considered for this HRS evaluation of the SDD because laboratory data sheets are not available.

All background and contaminated samples documenting the observed releases were collected from the aquifer of concern (the Great Miami Aquifer), which is estimated to be 150 to 250 feet thick in the vicinity of the landfill (Ref. 15, p. 27 and Ref. 18, p. 14)

Chemical Analysis

- Background Concentrations: Monitoring well MW-104 is located across Dryden Road at the Dayton Power and Light Company 1900 Dryden Road facility (Ref. 15, p. 19 and Ref. 30, p. 2). Monitoring well MW-104 is located upgradient of the landfill because the primary direction of ground water flow is west-southwest (Ref. 15, p. 14). Monitoring well MW-103 is located along the western edge of the landfill (Ref. 15, p. 18). Monitoring well MW-103 is upgradient of the landfill when river stages of the Great Miami River cause ground water to flow east-southeast (Ref. 15, p. 14). Site-related contaminants were not detected in MW-103 or MW-104 during the STEP investigation (Ref. 15, p. 27).

Sample ID[a]	Screened Interval (feet bgs or msl)	Date	Reference
MW-104 (S22 and EBNB9)	24 to 34 feet bgs	7/9/96	15, p. 27;30, p. 2
MW-103 (S24 and EBNC1)	22 to 32 feet bgs	7/9/96	15, p. 27 and 102

Sample ID[a]	Hazardous Substance	Concentration (units)	Sample Quantitation Limit	Reference
MW-104 (S22 and EBNB9)	Chloroethane	Not detected	10 µg/L	15, p. 27; 16, p. 103
MW-104 (S22 and EBNB9)	1,1-Dichloroethane	Not detected	10 µg/L	15, p. 27; 16, p. 103
MW-104 (S22 and EBNB9)	1,2-Dichloroethene (total)	Not detected	10 µg/L	15, p. 27; 16, p. 103
MW-104 (S22 and EBNB9)	Toluene	Not detected	10 µg/L	15, p. 27; 16, p. 103
MW-103 (S24 and EBNC1)	Chloroethane	Not detected	10 µg/L	15, p. 27; 16, p. 106
MW-103 (S24 and EBNC1)	1,1-Dichloroethane	Not detected	10 µg/L	15, p. 27; 16, p. 106
MW-103 (S24 and EBNC1)	1,2-Dichloroethene (total)	Not detected	10 µg/L	15, p. 27; 16, p. 106
MW-103 (S24 and EBNC1)	Toluene	Not detected	10 µg/L	15, p. 27; 16, p. 106

- Contaminated Samples:

Sample ID[a]	Screened Interval (feet bgs or msl)	Date	Reference
MW-101 (S23 and EBNC0)	24.5 to 34.5 feet bgs	7/9/96	15, p. 27 and 99
MW-102 (S25 and EBNC3)	20 to 30 feet bgs	7/9/96	15, p. 27 and 101

Sample ID[a]	Hazardous Substance	Concentration (units)	Sample Quantitation Limit	Reference
MW-101 (S23 and EBNC0)	1,1-Dichloroethane	13 µg/L	10 µg/L	15, p. 23; 16, p. 104
MW-101 (S23 and EBNC0)	1,2-Dichloroethene (total)	150 µg/L	10 µg/L	15, p. 27; 16, p. 104
MW-102 (S25 and EBNC3)	Chloroethane	22 µg/L	10 µg/L	15, p. 27; 16, p. 110
MW-102 (S25 and EBNC3)	Toluene	15 µg/L	10 µg/L	15, p. 27; 16, p. 110

Note:

[a] Two Sample IDs are provided. One Sample ID was issued while during sample collection activities and the laboratory analyzing the samples issued a separate Sample ID.

Attribution:

Between 1950 and 1970, drummed wastes were occasionally accepted at the landfill (Source 1). The drums were emptied and either buried or sold to drum recyclers. During previous investigations, drums were noted at the landfill, some of which still contained nonliquids. Between June 1973 and July 1976, drums containing hazardous waste from two nearby Hobart facilities in Dayton, Ohio, were accepted at the landfill. About 15 55-gallon drums of waste per month were transported from Hobart to the SDD or to the Blaylock Landfill during this time. The drums contained the cleaning solvents 1,1,1-trichloroethane; methyl ethyl ketone; and xylene; cutting oils; paint; Stoddard solvent; and machine-tool, water-based coolants. In May 1978, the MCCGHD and OEPA conducted an inspection of the landfill and noted several problems, including the presence of containers labeled “hazardous” (Ref. 8, pp. 10 and 11; Ref. 9, pp. 1 and 2; Ref. 27, p. 1).

The Dayton Power and Light facility is located immediately upgradient of the landfill, however, this facility has no identified sources of chlorinated solvents (Ref. 35, p. 1).

During the STEP investigation in 1996, OEPA collected ground water samples from monitoring wells MW-101, MW-102, and MW-103 at the SDD and MW-104 east of the SDD at the Dayton Power and Light Company facility. Monitoring well MW-104 is located upgradient of the landfill because the primary direction of ground water flow is west-southwest (Ref. 15, p. 14). MW-103 is located along the western edge of the landfill, just north of MW-102 and northwest of MW-101 (Ref. 15, pp. 15, 19, 20, 104, 105, and 106; and Ref. 30, p. 2). Monitoring well MW-103 is upgradient of the landfill when river stages of the Great Miami River cause ground water to flow east-southeast (Ref. 15, p. 14). The following hazardous substances were detected in ground water samples from MW-101 and MW-102 at concentrations greater than background (Ref. 15, p. 27):

- Chloroethane
- 1,1-Dichloroethane
- 1,2-Dichloroethene (total)

- Toluene

It should be noted that 1,2-dichloroethene; 1,1-dichloroethane; and chloroethane, which were detected in the ground water samples, are degradation products of tetrachloroethene (detected in soil samples) or 1,1,1-trichloroethane (disposed of on the landfill by Hobart) (Ref. 9, p. 1; Ref. 15, p. 18; Ref. 28, pp. 24 and 29). Highly chlorinated solvents such as tetrachloroethene and trichloroethene are typically biodegraded under natural conditions via reductive dechlorination, a process that requires both electron acceptors (the chlorinated aliphatic hydrocarbons) and an adequate supply of electron donors. Electron donors include fuel hydrocarbons or other types of anthropogenic carbon (e.g., landfill leachate) or natural organic carbon (Ref. 28, p. 3). SDD is a landfill and therefore an adequate supply of electron donors in the form of landfill leachate is likely present.

EPA collected soil samples from the landfill as part of the SSI. 1,2-Dichloroethene was detected in soil samples collected during the SSI and was also detected in ground water samples collected during the STEP investigation (Ref. 14, p. 24; Ref. 15, p. 27).

The landfill is unlined. Monitoring well MW-101 is 38 feet deep and the log does not mention the presence of any liner (Ref. 15, p. 106). Monitoring well MW-101 is located at SDD (Ref. 15, p. 9). Solvents were known to have been disposed of in the landfill and have been detected in soil and ground water samples collected from the landfill. All hazardous substances in the observed release by chemical analysis to ground water are documented as associated with landfill (see Section 2.2.2 of this document).

Hazardous Substances Released

Chloroethane
1,1-Dichloroethane
1,2-Dichloroethene
Toluene

Ground Water Observed Release Factor Value: 550

3.2 WASTE CHARACTERISTICS

3.2.1 TOXICITY/MOBILITY

Hazardous Substance	Source No. (and/or Observed Release)	Toxicity Factor Value	Mobility Factor Value[a, b]	Does Haz. Substance Meet Observed Release by chemical analysis? (Y/N)	Toxicity/ Mobility (Ref. 1, Table 3-9)	Reference
1,1-Dichloroethane	1, OR	10	1	Y	10	Ref. 2, p. BI-4 and Ref. 15, p. 27
1,2-Dichloroethene (total)	1, OR	100	1	Y	100	Ref. 2, p. BI-4 and Ref. 15, p. 27
Chloroethane (Ethyl Chloride)	1, OR	1	1	Y	1	Ref. 2, p. BI-6 and Ref. 15, p. 27
Toluene	1, OR	10	1	Y	10	Ref. 2, p. BI-11 and Ref. 15, p. 27
Tetrachlorethene	1	100	1	Y	100	Ref. 2, p. BI-10 and Ref. 15, p. 22
2-Methylnaphthalene	1	0	2.00E-03	Y	0	Ref. 2, p. BI-9 and Ref. 15, p. 22
Phenanthrene	1	0	2.00E-05	Y	0	Ref. 2, p. BI-9 and Ref. 15, p. 22
di-n-butylphthalate	1	10	2.00E-05	Y	2.00E-04	Ref. 2, p. BI-4 and Ref. 15, p. 22
Fluoranthene	1	NA	NA	Y	NA	Ref. 15, p. 22
Pyrene	1	100	2.00E-05	Y	2.00E-03	Ref. 2, p. BI-10 and Ref. 15, p. 22
Butylbenzyl-phthalate	1	10	2.00E-05	Y	2.00E-04	Ref. 2, p. BI-2 and Ref. 15, p. 22

Hazardous Substance	Source No. (and/or Observed Release)	Toxicity Factor Value	Mobility Factor Value[a, b]	Does Haz. Substance Meet Observed Release by chemical analysis? (Y/N)	Toxicity/ Mobility (Ref. 1, Table 3-9)	Reference
Benzo(a) anthracene	1	1000	2.00E-09	Y	2.00E-06	Ref. 2, p. BI-2 and Ref. 15, p. 22
Chrysene	1	10	2.00E-09	Y	2.00E-08	Ref. 2, p. BI-3 and Ref. 15, p. 22
Bis(2-ethylhexyl) phthalate	1	100	2.00E-07	Y	2.00E-05	Ref. 2, p. BI-2 and Ref. 15, p. 22
Benzo(b)fluoranthene	1	NA	NA	Y	NA	Ref. 15, p. 22
Benzo(k)fluoranthene	1	100	2.00E-09	Y	2.00E-07	Ref. 2, p. BI-2 and Ref. 15, p. 22
Benzo(a)pyrene	1	10000	2.00E-09	Y	2.00E-05	Ref. 2, p. BI-2 and Ref. 15, p. 22
Indeno(1,2,3-cd) pyrene	1	1000	2.00E-09	Y	2.00E-06	Ref. 2, p. BI-8 and Ref. 15, p. 22
Dibenzo(a,h) anthracene	1	10000	2.00E-09	Y	2.00E-05	Ref. 2, p. BI-4 and Ref. 15, p. 22
4,4'-DDD	1	100	2.00E-07	Y	2.00E-05	Ref. 2, p. BI-4 and Ref. 15, p. 22
Aroclor-1254	1	10000	2.00E-07	Y	2.00E-03	Ref. 2, p. BI-10 and Ref. 15, p. 22
Aroclor-1260	1	10000	2.00E-07	Y	2.00E-03	Ref. 2, p. BI-10 and Ref. 15, p. 22
Benzene	1	1000	1	Y	1000	Ref. 2, p. BI-2 and Ref. 11, p. 20
2-Butanone (also known as, methyl ethyl ketone)	1	1	1	Y	1	Ref. 2, p. BI-8 and Ref. 11, p. 20

Hazardous Substance	Source No. (and/or Observed Release)	Toxicity Factor Value	Mobility Factor Value[a, b]	Does Haz. Substance Meet Observed Release by chemical analysis? (Y/N)	Toxicity/ Mobility (Ref. 1, Table 3-9)	Reference
Chlorobenzene	1	100	1	Y	100	Ref. 2, p. BI-3 and Ref. 11, p. 20
Ethylbenzene	1	10	1	Y	10	Ref. 2, p. BI-6 and Ref. 11, p. 20
2-Methyl-2-pentanone	1	NA	NA	Y	NA	Ref. 11, p. 20
Trichloroethene	1	10000	1	Y	10000	Ref. 1, pp. 51589 and 51601; Ref. 31, p. 2; and Ref. 11, p. 21
Vinyl Chloride	1	10000	1	Y	10000	Ref. 2, p. BI-12 and Ref. 11, p. 21
Xylene	1	100	1.00E-02	Y	1	Ref. 2, p. BI-12 and Ref. 11, p. 21

Notes:

a Pursuant to Section 3.2.1.2, a mobility factor of 1 was assigned for all hazardous substances that met the criteria for an observed release by chemical analysis to at least one aquifer underlying the source (Ref. 1, p. 51601).

b Ground water mobility values for non-karst aquifers were included in the table above because no karst aquifers exist within the target distance limit (see Section 3.0 for a description of aquifers within the target distance limit).

Toxicity/Mobility Factor Value: 10,000
(Based on trichloroethene and vinyl chloride)
(Ref. 1, Table 3-9)

3.2.2 HAZARDOUS WASTE QUANTITY

Source No.	Source Type	Source Hazardous Waste Quantity
1	Landfill	422.79

Sum of Values: 422.79

Hazardous Waste Quantity Factor Value: 100
(Ref. 1, Table 2-6)

3.2.3 WASTE CHARACTERISTICS FACTOR CATEGORY VALUE

Toxicity/Mobility Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100
Toxicity/Mobility x HWQ Factor Value: 1,000,000

Waste Characteristics Factor Category Value: 32
(Ref. 1, Table 2-7)

3.3 TARGETS

3.3.1 NEAREST WELL

The nearest drinking water well is located at the Delphi Automotive Systems plant northeast of the SDD across the Great Miami River at 1515 Cincinnati Street, Dayton, Ohio. Two ground water wells are located at the Delphi Automotive Systems plant, and water from the wells supplies drinking water to 220 employees (Ref. 19, p. 1).

Well ID: Delphi Automotive Systems, 1515 Cincinnati Street, Dayton, Ohio
Level of Contamination (I, II, or potential): Potential
If potential contamination, distance from source in miles: 0.5 to 1 mile

Nearest Well Factor Value: 9
(Ref. 1, Table 3-11)

3.3.2 POPULATION

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

Level I Well	Aquifer No.	Population	Reference
Not applicable (NA)			

Sum of Population Served by Level I Wells: 0
Sum of Population Served by Level I Wells x 10:

Level I Concentrations Factor Value: 0

3.3.2.3 Level II Concentrations

Level II Well	Aquifer No.	Population	Reference
NA			

Sum of Population Served by Level II Wells: 0

Level II Concentrations Factor Value: 0

3.3.2.4 Potential Contamination

Distance Category	Population	Reference	Distance-Weighted Population Value (Ref. 1, Table 3-12)
0 to ¼ mile	0		
>¼ to ½ mile	0		
>½ to 1 mile	220 (Delphi Automotive Systems)	Ref. 19, p. 1; Ref. 20, pp. 1, 4, and 5	52
>1 to 2 miles	3,855 (City of Oakwood, Springhouse Wellfield)	Ref. 21, pp. 2 and 11	939
>2 to 3 miles	5,140 (City of Oakwood, Finwood Wellfield) 13,454 (Montgomery County)	Ref. 21, p. 2; Ref. 20, pp. 1, 4, and 5; Ref. 25, p. 1	2,122
>3 to 4 miles	12,000 (City of West Carrollton)	Ref. 23, p. 1 Ref. 20, pp. 1, 4, and 5	1,306

Well logs obtained from the Ohio Department of Natural Resources (ODNR) for a 1-mile radius from the landfill did not include private wells (Ref. 29, pp. 1 through 36); therefore, residents located within 1 mile of the landfill are likely served by public well systems. Private wells may exist between 1 and 4 miles from the landfill but well logs were not readily available. Therefore, the population served by private wells in a 4-mile radius was not included in the calculation of the population value.

Calculations:

The City of Oakwood Springhouse wellfield is located 1 to 2 miles from the landfill (Ref. 21, p. 12). The Springhouse wellfield contains three drinking water supply wells (Wells No. 1, 2, and 3), and is part of a blended system that incorporates seven wells (Ref. 21, p. 11). None of the seven wells that supply the city system contribute greater than 40 percent of the drinking water supply; therefore, the total population served by the City of Oakwood drinking water supply system (9,000) was apportioned equally among all sources of the drinking water to the system as shown below (Ref. 21, p. 11).

$$(9{,}000/7) \times 3 = 3{,}855$$

The City of Oakwood Finwood wellfield is located 2 to 3 miles from the landfill (Ref. 21, p. 12). The Finwood wellfield contains four drinking water supply wells (Wells No. 4, 5, 6, and 7), and is part of a blended system that incorporates seven wells (Ref. 21, p. 11). None of the seven wells that supply the city system contribute greater than 40 percent of the drinking water supply; therefore, the total population served by the City of Oakwood drinking water supply system (9,000) was apportioned equally among all sources of the drinking water to the system as shown below (Ref. 21, p. 11).

$$(9{,}000/7) \times 4 = 5{,}140$$

The Montgomery County stand-by drinking water wells are located between 2 and 3 miles from the landfill (Ref. 20, pp. 1, 4, and 5). The Montgomery County population value was multiplied by 0.10 because water from the stand-by wells would likely be blended with City of Dayton water before distribution and would constitute about 10 percent of the drinking water distributed (Ref. 8, p. 15). However, it should be noted that the stand-by wells supplied 50 percent of the drinking water when they were last used in 1988 (Ref. 25, p. 1).

134,540 x 0.10 = 13,454

Sum of Distance-Weighted Population Values: 4,419
Sum of Distance-Weighted Population Values/10: 441.9

Potential Contamination Factor Value: 441.9

3.3.3 RESOURCES

Available information does not indicate that ground water is used as a resource within the 4-mile target distance limit; therefore, a resources factor value of 0 is assigned (Ref. 1, p. 51604).

Well ID	Aquifer No.	Resource Use	Reference
NA			

Resources Factor Value: 0

3.3.4 WELLHEAD PROTECTION AREA

Information provided by OEPA and the City of West Carrollton, Ohio, indicate that a wellhead protection area is present in the vicinity of West Carrollton's municipal drinking water supply wells (Ref. 20, p. 5; Ref. 24, p. 1). A wellhead protection plan has been prepared and meets all the requirements of Ohio's wellhead protection plan program (Ref. 24, p. 1). The Ohio wellhead protection program adequately addresses the requirements of Section 1428 of the Safe Drinking Water Act (Ref. 32, p. 1).

Area	Use	Reference	Value
West Carrollton	Wellhead protection area within target distance limit	Ref. 1, p. 51604; Ref. 24, p. 1	5

Wellhead Protection Area Factor Value: 5